STRUCTURAL CHANGE AND INDUSTRIALIZATION IN THE 1980S AND 1990: THE CASE IN MALAYSIAN MANUFACTURING SECTOR

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Abstract: The paper examines the process of structural change experienced by the Malaysian economy in general, and in particular the manufacturing sector, during the 1980s and 1990s. The study is motivated by the fact that the economy had experienced a remarkable process of structural change during the last two decades. The early 1980s witnessed the start of heavy industrialization and a second round of import substitution following a successful export oriented industrialization strategy implemented from the beginning of the 1970s.

Structural change will be examined in the following ways. Firstly we will look at the relative contributions of the various economic sectors, in particular the manufacturing sector, to the Gross Domestic Product (GDP). In addition, we will also look the structure of exports, and the components of final demand expenditures.

Secondly, we will employ econometric methodology to test for structural change in the manufacturing sector during the study period. A production function of the Cobb-Douglas type is estimated for the Malaysian manufacturing sector. The supply side of the sector is represented by a production function over a cross section of the manufacturing sector (28 industries at three digit levels). Suppose that there is an annual production function for the sector. Structural change of the sector will be reflected in the estimated parameters: the estimated production elasticities would be estimated differently for each year. This methodology has been employed by Yokoyama (1991) in his study of structural change of the Malaysian manufacturing sector in the 1980s.

1. Introduction

The paper examines the process of structural change experienced by the Malaysian economy during the 1980s and 1990s. The study is motivated by the fact that the economy had experienced a remarkable process of structural change during the last two decades. The early 1980s witnessed the start of heavy industrialization drive and a second round of import substitution following a successful export oriented industrialization strategy implemented from the beginning of the 1970s.

Structural change will be examined in the following ways. Firstly, we will look at the relative contributions of the various economic sectors, in particular the manufacturing sector, to the Gross Domestic Product (GDP). In addition, we also look at the structure of exports, and the components of final demand expenditures. Secondly, we will employ econometric methodology to test for structural change in the manufacturing sector of the economy during the study period.

The structure of the paper is as follows. Following the introduction, an overview on structural change is given. In the third section, a test of structural change in the manufacturing sector is carried out. The final section gives a summary and concluding remarks.

2. Structural Change: An Overview

The Malaysian economy has achieved sustainable growth and structural transformation since Independence in 1957. Rapid growth has been achieved with remarkable price stability. The remarkable growth performance can be attributed to improved productivity of resources, appropriate trade strategies, favourable external environment and sound macro-economic management (Zakariah 1999). At Independence in 1957, the economy was dependent on the production of primary commodities rubber, tin and timber for exports. For example, in 1961 these commodities contributed 70.7 percent to total export earnings with rubber alone accounting 48.4 percent. The growth of the economy then depended on the export performance of these commodities.

The transformation of the economy has been the result of conscious planning and also the impact of market forces, both internal and external. Several considerations required appropriate policy responses from the State (Mohammad and Choudhury 1996). First, being a trade-oriented economy with commodity prices determined in the world

markets, the economy was subjected to the adverse effects of term of trade fluctuations. Secondly, the economy was characterized by a substantial degree of dualism (Stern 1987). Within the agriculture sector existed a modern plantation sector, characterized by relatively higher productivity, and a traditional smallholding sector, characterized by low productivity and incomes.

Term of trade fluctuations translated into fluctuations in export and Government revenues. Export earnings stability was therefore desired. A stable stream of income from trade can be beneficial for the following reasons (Jaafar 1989). First, stability in export earnings can promote better planning for the Government in terms of its annual budgetary process and also economic development plans. In Malaysian experience, two development plans have been markedly affected by substantial changes in the prices of primary commodities (The Third Malaysia Plan 1976-80 and The Fourth Malaysia Plan 1981-1985). Second, there is a strong perception that reduced variability in export proceeds would remove much of the uncertainty regarding investment decisions in the agricultural sector.

Therefore there was a need to diversify and modernize the agricultural sector and to broaden the export base, with a view to increase the contribution from manufactured exports, which accounted for just 4.5 percent of total exports in 1961. The diversification of the agricultural sector was carried out via large-scale development of oil palm planting from the 1960s and cocoa from the 1970s. The degree of State intervention in these ventures has been significant. Government assistance was rendered to smallholders in oil palm, rubber and cocoa plantings through the opening of new land, and distribution of new improved seeds. Public sector agencies such as the Federal Land Development Authority (FELDA), Rubber Industry Smallholders Development Authority (RISDA) played significant roles. But what is significant is that, besides the positive intervention from the Government, the shift out of rubber into oil palm and cocoa was dictated by market forces viz. response to remunerative prices.

The Government also followed a strategy of allowing external shocks to pass through to the rest of the economy. In this way, market participants are allowed to react to market forces.

Diversification of the export base via industrialization was another response to counter the problems posed by primary commodities' export instability. In fact industrialization has been adopted by Malaysia, a small open economy, as a major goal of economic development. The country embarked on this strategy soon after achieving Independence. This strategy was aimed to tackle many of the development issues faced by developing countries viz. too high commodity concentration, uneven income distribution, unemployment and instability in the balance of payments (Zakariah 1999).

The implementation of import substitution industrialization strategy in the 1960s, export oriented industrialization strategy in the 1970s, and heavy industries in 1980s, have helped to transform the structure of the economy from an agriculture-based to a manufacturing-based economy. Many authors have written on the subject of industrialization and structural change in the Malaysian economy (for example Edwards 1990, Stern 1991, Mohammad and Choudhury 1996, Jomo, K.S. and Edwards, C. 1998, Zakariah 1999). In subsequent analysis, we focus on the structural changes that occurred in the last two decades.

The Malaysian economy has achieved remarkable growth in the 1980s and 1990s with the exception of two economic recessions, the first one in the mid-80s, and the other in 1998 (Table 1). The mid-80s recession was precipitated by broad based declines in the export prices of primary commodities. The 1998 recession was mainly caused by the East Asian Financial Crisis, starting with the devaluation of the Thai baht in July of 1997. The economy has recovered from the 1998 recession, achieving 5.4 percent growth in 1999. Growth for this year is forecasted to be 5.8 percent (Bank Negara Malaysia *Annual Report 1999*).

The 1980s witnessed a remarkable transformation of the economy, which continued into the 1990s. In 1980 the manufacturing sector accounted for 19.6 percent of Gross Domestic Product (GDP) compared to 22.9 per cent by agriculture, forestry, livestock and fishing, and 10.1 per cent from mining and quarrying (Table 2). The primary sector therefore contributed 33 per cent to GDP. In 1990 the manufacturing sector contributed 26.2 per cent to GDP compared to 28.2 per cent, by the primary sector, thus narrowing the gap. By the year 2000, the share of manufacturing in GDP is estimated at 34.7 per cent compared to the combined share of primary sector at 19.8 percent. In the 1980s the share of agriculture (and others) stabilized at around 20 per cent, but declined rapidly in the 1990s to 12.8 percent in the year 2000. The economy's leading industries have shifted from those that were primary-based to manufacturing-based.

The success of the manufacturing sector in the 1980s is attributed to the interplay of three important factors (Okposin et al. 1999, p. 72). The factors are, the development in the world trade, the domestic market and the Industrial Master Plan (IMP 1968-95). The implementation of the IMP has been instrumental to the development of the manufacturing sector. The IMP provided a long- term indicative plan for the development of the manufacturing sector, with emphasis on certain sub-sectors. The specific recommendations of the IMP, which have been implemented, were the rationalization of fiscal incentives to promote investment. The incentives were given in order to induce reinvestments, linkages, exports and training. The strategies adopted by the IMP were to simultaneously change the production mix of manufacturing activities and the market orientation of output. To achieve these, the development of export oriented strategies, the development of heavy industries with strong linkages and resource-based industries were pursued.

The composition of exports reflects the trend on what happened on the supply side of the economy. With the increasing importance of the manufacturing sector, the export structure experienced a remarkable transformation with manufactured exports' share in

total exports increasing from 12 percent in 1970, to 22 percent in 1980 and 80 percent in 1995 (Table 3). The current share of manufactured exports is around 85 percent.

Demand also experienced structural change during the last two decades. At the beginning of the 1980s, the most rapid growth occurred through Public Expenditure (consumption plus investment) (Figure 1). The rapid growth in Public Expenditure was to counter the effect the world recession. However by the middle of the 1980s, with the implementation of structural adjustment policies, Public Expenditure slowed down. Exports took over the leading role. Between 1983 and 1987, growth in exports exceeded the growth rates of the other demand components. The economy experienced a recession in 1985, with most of the demand components registering negative growth. The export-led growth recovery in 1987 was followed by strong growth in private investment and private consumption expenditure. Foreign direct investment (FDI) played an important role in the recovery process. Up to the period before the next recession in 1998, it can be said that the main growth drivers of the economy have been exports, private investment and consumption expenditure. Public expenditure played an accommodating role.

In 1993 the Government launched the Domestic Investment Initiative (DII) programme with a view to encourage greater domestic investment. There was a realization that FDI could not be relied fully and that the low ratio of domestic investment to foreign investment (40 to 60) needed to be rectified. There was also the realization for the need of import-substitution of intermediate and investment goods. The DII identified six strategies: (i) to increase domestic value-added (ii) to strengthen and improve access to local capital markets (iii) to develop Malaysian multinational anchor companies (iv) to strengthen SMI development (v) to strengthen institutional support; and (vi) to develop infrastructure for domestic use via special industrial estates, and access to common user services for testing and designing (MITI 1994).

3. Structural Change in Production

The rapid changes in demand as described earlier, with the rising importance of private investment, together with a massive inflow of FDI after 1986, might have led to structural changes on the supply side also. In this section we test the hypothesis to determine whether structural change has occurred on the supply side, in particular within the manufacturing sector in the 1980s and 1990s. This study is an extension of the study done by Yokoyama (1991). We employed his methodology to test for structural change.

Yokoyama's methodology is as follows. A production function is estimated for the Malaysian manufacturing sector. The supply side of the sector is represented by a production function over a cross section of the manufacturing industry. Suppose that there is an annual production function for the sector. Structural change of the sector would be reflected in the estimated parameters: the estimated production elasticities would be estimated differently for each year.

Yokoyama investigated empirically structural changes in the Malaysian manufacturing sector in the 1980s. The data used in his study was obtained from the Department of Statistic's Industrial Survey. The survey covers 93 percent of the output, 90 percent of the value added and 85 percent of employment of the manufacturing sector (Malaysia 1990).

The production function estimated is of the Cobb-Douglas type as follows:

$$Y = AK^{\alpha}L^{\beta}$$

where Y, K, and L represent value-added, capital and labour inputs respectively. Yokoyama reported estimates of annual production functions for the years 1984, 1987 and 1988 using data for 28 industries (three digit levels) in the manufacturing sector.

The results obtained by Yokoyama may be summarized as follows. First, the annual production function is revealed to be mostly homogenous of degree one in each case. Second, the production elasticity of capital is significantly higher and labour lower when capital intensive industries are included. Third, the production elasticity for capital in late 1980s is lower and that of labor higher than at the beginning of the decade. This is an indication that structural change has occurred in the manufacturing sector. The decrease in the capital elasticity according to Yokoyama, corresponds with the Japanese experience, although the speed of decline for Malaysia is more rapid. The Malaysian manufacturing industries are undergoing structural changes on the production side. An empirical explanation for the decline in capital production elasticity and the corresponding rise in the labor share is the observed capital deepening experienced by the manufacturing sector in the 1980s. With more capital per worker, labour productivity would increase.

We have estimated annual production functions for the manufacturing sector by ordinary least squares using the data set used by Yokoyama for the 1980s period, and replicated his methodology employing Annual Surveys of Manufacturing Industries data from 1989 to 1996. The data were provided by the Department of Statistics. The results are reported in Table 5.Table 6 reports regressions excluding capital intensive industries.The statistical fits of the estimated regressions are good in terms of coefficients of multiple determination, and signs and significance of coefficients. Heteroscedasticity is not a problem for the estimated production functions from 1983 to 1988. However heteroscedasticity becomes a problem in the 1989 and 1992-1996 regression estimates. This problem can be rectified using generalized least squares.

Major conclusions from the Yokoyama study can be seen from Table 5. When we combine the results for the 1980s with the 1990s, we can make the following observations. First, after 1988 the capital elasticity starts to rise again and the labour share to decline till 1991, before rising again. This period coincides with a rapid inflow of FDI. Given the nature and direction of FDI into the manufacturing sector, we would expect capital deepening to continue at least into the first half of the 1990s. This means that the capital elasticity would continue to decline. The converse is observed however. One possible explanation that we would like to conjecture is the probable rise in the bargaining power of the owners of capital. Second, after 1988 the sum of output elasticities is less than one. The results are the same when we excluded the capital intensive industries. The manufacturing sector appears to be experiencing declining returns to scale even though capital intensity is rising.

4. Conclusion

The manufacturing sector has contributed to the overall development of the Malaysian economy. Rapid growth achieved by the sector, with the exception of the recession years, has been the result of an interplay of several sectors viz. sound macroeconomic management, pro-active industrialization policies, world trade and the responsiveness of the private sector to internal and external factors.

This study has set out to test for structural change in the 1980s and 1990s within the manufacturing sector using the methodology employed by Yokoyama. An important finding of the study is the observed decline in the sum of output elasticities after 1988. Prior to that the manufacturing sector is characterized by constant returns to scale. Decreasing returns to scale may be related to productivity of investments.

In the next two decades or so the Malaysian economy will achieve a developed economy status. That is the target of Vision 2020. We are now talking about leaving the

P-economy to enter the K-economy. While this study only incorporates two conventional inputs, with knowledge being embedded in the respective inputs, any discussion on this issue would be conjectural in nature. But we will conjecture anyway. Our study indicates that constant returns to scale or decreasing returns would not be compatible with the inclusion of capital intensive industries. For a successful entry into the K-economy, an ICT consistent human resource strategy would be required.

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Table 1: Annual Growth Rate of Gross Domestic Product 1980-1998

Year	Growth Rate, %	Year	Growth Rate, %
1980	7.6	1990	10.1
1981	7.1	1991	8.7
1982	8.8	1992	7.6
1983	6.3	1993	8.3
1984	7.8	1994	9.3
1985	-1.1	1995	9.4
1986	1.2	1996	8.6
1987	5.4	1997	7.7
1988	8.9	1998	-6.7
1989	8.8		

(Data computed from Ministry of Finance, Economic Report, various issues)

Table 2: GDP by Industry of Origin, 1960-2000 (in %)

Industry	1960	1965	1970	1975	1980	1985	1990	1995	2000
Agriculture, forestry, livestock & fishing	37.9	29.6	30.8	27.7	22.9	20.8	19.1	13.5	12.8
Mining & quarrying	5.9	8.0	6.3	4.6	10.1	10.5	9.7	7.5	7.0
Manufacturing	8.5	9.7	13.4	16.4	19.6	19.7	26.2	33.1	34.7
Construction	3.0	4.0	3.9	3.8	4.6	4.8	3.4	4.5	3.5
Electricity, gas and water	1.4	1.8	1.9	2.1	1.4	1.7	1.9	2.3	2.9
Transport, storage & communication	3.6	3.5	4.7	6.2	5.7	6.4	6.7	7.4	8.2
Wholesale & retail trade, hotel & restaurants	15.7	16.4	13.3	12.8	12.1	12.1	10.8	12.3	12.8
Finance, insurance, real estate & business services	1.4	1.5	8.4	8.5	8.3	8.9	9.5	10.8	13.6
Government services	17.9	20.3	11.1	12.7	10.3	12.2	10.6	9.5	9.9
Other Services	-	-	2.5	2.8	2.3	2.3	2.1	2.1	2.3
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: : Mid-Term Review of The 5th Malaysia Plan (1986-1990) Table 3-9, p.64-65
Mid-Term Review of The 7th Malaysia Plan (1996-2000) Table 2-3, p.39

Table 3: Export of Manufactured Goods, 1970-1998

	1970		1980		1985		1990		1995		1997		1998	
	RM million	%	RM million	%	RM million	%	RM million	%	RM million	%	RM million	%	RM million	%
Food, beverage and tobacco	112	18	475	8	594	5	2061	4	3676	2	4473	2	5499	2
Texiles, clothing and footwear	40	7	806	13	1289	11	3983	8	6712	5	7616	4	9441	4
Wood product	88	14	467	8	363	3	1535	3	6265	4	8524	5	8691	4
Rubber products	17	3	84	1	133	1	1356	3	3218	2	3987	2	5777	2
Chemicals and petroleum products	197	32	361	6	1412	12	3192	7	7473	5	13005	7	15257	6
Non-metallic mineral products	20	3	61	1	150	1	771	2	1678	1	1709	1	2096	1
Iro and steel and metal manufactures	26	4	161	3	300	2	1629	4	4819	3	5741	3	8348	4
Electrical and														

	1970		1980		1985		1990		1995		1997		1998	
	RM million	%	RM million	%	RM million	%	RM million	%	RM million	%	RM million	%	RM million	%
electronic machinery and appliances	17	3	2832	46	6028	50	26496	56	96892	66	119025	66	160908	68
Other machinery and transport equipment	68	11	407	7	1031	8	2234	5	5247	4	4959	3	8059	3
Other manufactures*	27	5	447	7	831	7	3886	8	8400	6	11153	6	14125	6
Total manufactured exports	612	100	6101	100	12111	100	47143	100	147507	100	180192	100	238201	100
Total Exports (fob)	5200		28013		37576		79646		184986		220891		286563	
Manufactured exports as % of total exports	12		22		32		60		80		82		83	

*Includes paper and pulp products, scientific instruments, etc.
Source: Ministry of Finance, Economic Report, Various issues.

Table 4: Growth Rates of Demand Components of GDP 1980-1998, %.

Year	Private Consumption	Private Investment	Exports	Government Expenditure
1980	17.7	39.5	17.1	46.4
1981	16.0	13.8	-1.9	40.8
1982	8.6	6.9	6.7	9.2
1983	9.7	11.7	12.4	-5.8
1984	8.6	5.1	20.6	0.2
1985	1.7	-8.1	-1.5	-0.2
1986	-9.4	-16.7	-5.2	5.9
1987	3.2	7.7	26.1	-10.1
1988	19.0	27.0	20.5	4.0
1989	18.0	37.0	22.4	13.6
1990	15.1	26.4	18.4	14.9
1991	14.3	29.8	18.0	11.3
1992	7.8	1.7	9.0	10.4
1993	8.4	22.8	18.7	2.1
1994	13.8	31.7	28.2	9.0
1995	13.1	28.8	20.1	9.0
1996	9.5	15.8	10.1	15.0
1997	8.1	11.7	13.7	4.7
1998	-7.7	-53.3	24.3	4.4

(Calculated using data from Ministry of Finance, Economic Report, various issues, data on Government Expenditure are obtained from IFS, CD-ROM)

Table 5: Production Elasticity (All 28 Industries)

Year	Capital Elasticity	t value	Labour Elasticity	t value	Sum of Elasticity	R-sq	SE	White Heteroskedasticity test
1983	0.683	11.2	0.284	4.1	0.967	0.95	0.34	3.73 (0.44)
1984	0.726	11.0	0.322	4.4	1.048	0.95	0.36	5.43 (0.25)
1985	0.644	8.5	0.322	3.5	0.966	0.91	0.44	6.52 (0.16)
1986	0.627	8.9	0.338	4.0	0.965	0.91	0.42	4.60 (0.33)
1987	0.602	7.6	0.403	4.5	1.005	0.90	0.47	4.75 (0.31)
1988	0.646	9.1	0.334	4.2	0.980	0.92	0.41	4.98 (0.29)
1989	0.698	9.9	0.239	3.1	0.937	0.92	0.40	9.87 (0.04)
1990	0.709	8.7	0.221	2.5	0.930	0.90	0.45	8.21 (0.08)
1991	0.703	8.5	0.221	2.6	0.924	0.90	0.44	7.04 (0.13)
1992	0.628	8.3	0.273	3.4	0.900	0.91	0.41	7.94 (0.09)
1993	0.593	7.9	0.295	3.6	0.889	0.91	0.41	10.19 (0.04)
1994	0.569	7.5	0.333	4.0	0.902	0.89	0.44	11.78 (0.02)
1995	0.549	8.2	0.346	4.5	0.895	0.91	0.41	5.60 (0.23)
1996	0.631	10.4	0.273	4.0	0.904	0.94	0.34	13.20 (0.01)

Table 6. Production Elasticity (Non-Capital Intensive 26 Industries)

Year	Capital Elasticity	t value	Labour Elasticity	t value	Sum of Elasticity	R-sq	SE	White Heteroskedasticity test
1983	0.659	6.8	0.323	3.0	0.982	0.95	0.34	4.27 (0.37)
1984	0.620	7.1	0.435	4.5	1.055	0.95	0.35	7.17 (0.13)
1985	0.520	4.9	0.460	3.8	0.980	0.91	0.44	7.72 (0.10)
1986	0.508	5.4	0.473	4.4	0.981	0.92	0.40	4.05 (0.40)
1987	0.477	4.9	0.539	5.0	1.016	0.91	0.45	4.02 (0.40)
1988	0.556	6.2	0.430	4.3	0.986	0.93	0.40	7.07 (0.13)
1989	0.593	6.8	0.366	3.7	0.959	0.93	0.39	11.20 (0.02)
1990	0.616	5.8	0.332	2.8	0.949	0.91	0.45	11.71 (0.02)
1991	0.596	5.5	0.341	2.9	0.936	0.90	0.43	12.57 (0.01)
1992	0.539	5.4	0.375	3.4	0.914	0.91	0.41	12.43 (0.01)
1993	0.508	5.1	0.394	3.5	0.902	0.91	0.41	15.44 (0.00)
1994	0.512	4.6	0.391	3.2	0.903	0.89	0.45	16.10 (0.00)
1995	0.441	4.7	0.469	4.4	0.910	0.91	0.40	10.51 (0.03)
1996	0.597	6.2	0.312	2.9	0.908	0.93	0.36	17.83 (0.00)

Figure 1: Plot of Growth Rates of Demand Components of GDP, 1980-1998